

# GRANULAR ACTIVATED CARBON SYSTEMS

Activated Carbon Submittal

For

**AQUA-New York**  
Seamans Neck Road Facility

Submitted to:

**AGVIQ-CH2M Hill**

Specification 43 31 13, Subsection 1.4 H



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July 2012

## **ATTACHMENTS**

Flow Sensor & Transmitter Information .....Attachment A

Pressure Gage Information .....Attachment B

## **ATTACHMENT A**

# **FLOW SENSOR & TRANSMITTER INFORMATION**

# Signet 8550 Flow Transmitters

**+GF+**



Check out the 9900 Transmitter  
for your single channel needs

Member of the ProcessPro® Family of Instruments



Panel Mount



Pipe, Wall, Tank and  
Integral Mount

Signet 8550 Flow Transmitters are advanced instruments that convert the signal from frequency and digital (S<sup>3</sup>L) flow sensors into a 4 to 20 mA signal for long distance transmission. Configuration flexibility is maximized with single or dual input/output, two optional relays for process control, two packaging options for integral/pipe mount or panel installation, and scalability for virtually any flow range or engineering unit. State-of-the-art electronic design ensures long-term reliability, signal stability, and simple user setup and operation.

## Features

- 2 or 4 wire power
- Available with single or dual input/output
- 4 to 20 mA scaleable outputs
- Permanent & resettable totalizers
- Relay options available
- NEMA 4X enclosure with self-healing window
- Output simulation for complete system testing



## Applications

- Flow Control and Monitoring
- Filtration or Softener Regeneration
- Effluent Totalization
- Pump Protection
- Feed Pump Pulsing
- Ratio Control
- Water Distribution
- Leak Detection

## Specifications

### General

Compatibility	Signet Flow Sensors with frequency outputs
Accuracy	± 0.5% of reading
Display	Alphanumeric 2 x 16 LCD
Update Rate	1 second
Contrast	User selectable, 5 levels

### Materials

Enclosure	PBT resin
Keypad	Sealed 4-key silicon rubber
Panel and Case Gasket	Neoprene
Window	Polyurethane coated polycarbonate

### Electrical

Power	12 to 24 VDC ±10%, regulated
-1	90 mA max.
-2	220 mA max.
-3	100 mA max.
Sensor Input Range	0.5 to 1500 Hz
Sensor Power	2-wire: 5 VDC ± 1% @ 1.5 mA 3 or 4 wire: 5 VDC ± 1% @ 20 mA
Current Output	Optically isolated from current loop short circuit protected 4 to 20 mA, isolated, passive, fully adjustable and reversible
Max. Loop Impedance	50 Ω max. @ 12 V 325 Ω max. @ 18 V 600 Ω max. @ 24 V
Update Rate	100 ms
Accuracy	±0.03 mA

### Relay Output

Mechanical SPDT contacts	High, Low, Pulse, Off
Maximum Voltage Rating	30 VDC @ 5 A , 250 VAC @ 5 A resistive load
Hysteresis	User selectable
Maximum 400 pulses/min	

### Open-Collector Output

	High, Low, Pulse, Off
	Optically isolated, 50 mA max. sink, 30 VDC max. pull-up voltage.
Hysteresis	User selectable for exiting alarm condition
Maximum 400 pulses/min.	

### Environmental

Operating Temperature	-10 °C to 70 °C	14 °F to 158 °F
Storage Temperature	-15 °C to 80 °C	5 °F to 176 °F
Relative Humidity	0 to 95%, non-condensing	
Enclosure	NEMA 4X/IP65 [front face only on panel mount]; field mount is 100% NEMA 4X/IP65	

### Shipping Weight

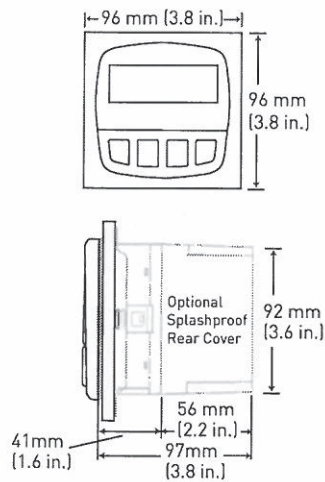
0.325 kg	0.7 lb
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### Standards and Approvals

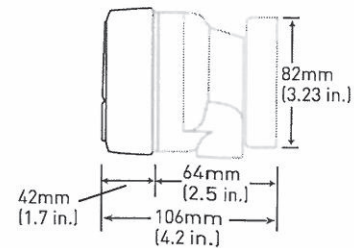
CE, UL, CUL
RoHS compliant
China RoHS
Manufactured under ISO 9001 for Quality and ISO 14001 for Environmental Management

## Dimensions

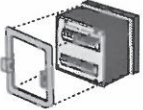



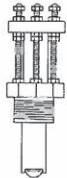

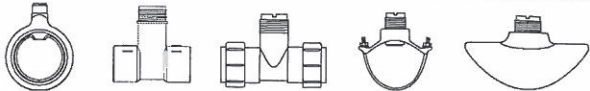
### 3-8550-XP



### Field version with universal mount



System Overview

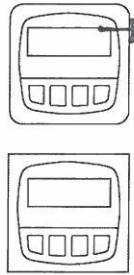
Panel Mount		Field Mount - Pipe, Tank, Wall	Integral Mount
Signet 8550 Flow Transmitter (Includes mounting bracket and panel gasket)		Signet 8550 Flow Transmitter with 3-8050 Universal Mount Kit	Signet 8550 Flow Transmitter with 3-8051 Universal Mount Kit
			
Signet Sensor 515   525   2000 2100   2507   2536 2537   2540   2551 2552		Signet Sensor 515   2507   2540 525   2536   2537 2000   2551   2552 2100	Signet Integral Mount Sensor 3-8510-XX 3-8512-XX
			
Signet Fittings			
All sold separately			

### Ordering Notes

- 1) Use the field mount version to directly mount the instrument to the Model 515 or 2536 integral mount sensor. See sensor data sheet for more information.
- 2) Field mount and sensor can be ordered in a package. See Integral Mount for more information.
- 3) Panel cutout should be 92 mm X 92 mm (3.62 in X 3.62 in.).
- 4) An optional splashproof rear cover for the panel mount version can be ordered separately if needed.

Please refer to Wiring, Installation, and Accessories sections for more information.

## Ordering Information

	Mfr. Part No. Code		Input/Output
	ProcessPro Flow Transmitter		
	Field mount package		
	3-8550-1	159 000 047	One input, 2 or 4 wire, 4 to 20 mA and open collector for Hi, Lo, Pulse, Freq.
	3-8550-2	159 000 049	One input 4 wire, 4 to 20 mA and two relays for Hi, Lo or Pulse
	3-8550-3	159 000 051	Two inputs, 2 or 4 wire, two 4 to 20 mA outputs and 2 open collectors for Hi, Lo, Pulse or Frequency
	Panel mount package		
	3-8550-1P	159 000 048	One input, 2 or 4 wire, 4 to 20 mA and open collector for Hi, Lo, Pulse, Freq.
	3-8550-2P	159 000 050	One input 4 wire, 4 to 20 mA and two relays for Hi, Lo or Pulse
	3-8550-3P	159 000 052	Two inputs, 2 or 4 wire, two 4 to 20 mA outputs and 2 open collectors for Hi, Lo, Pulse or Frequency

## Accessories and Replacement Parts

Mfr. Part No.	Code	Description
<b>Mounting Accessories</b>		
3-8050	159 000 184	Universal mounting kit
3-8051	159 000 187	Flow integral mount NPT
3-0000.596	159 000 641	Heavy duty wall mount bracket (panel mount only)
3-5000.598	198 840 225	Surface mount bracket (panel mount only)
3-8050.395	159 000 186	Splashproof rear cover (panel mount only)
3-9900.396	159 001 701	Angle adjustment adapter kit
<b>Liquid Tight Connectors and Other</b>		
3-9000.392	159 000 368	Liquid tight connector kit for rear cover (includes 3 connectors)
3-9000.392-1	159 000 839	Liquid tight connector kit, NPT (1 connector)
3-9000.392-2	159 000 841	Liquid tight connector kit, PG 13.5 (1 connector)
3-8050.396	159 000 617	RC filter kit (for relay use)

# Signet 2540 Stainless Steel High Performance Paddlewheel Flow Sensor

**+GF+**



Standard Sensor



Hot-Tap Sensor

The Signet 2540 Paddlewheel Flow Sensor offers the strength and corrosion resistance of stainless steel for liquid applications with low velocity measurements. Unique internal circuitry eliminates the need for magnets in the process fluid, enabling flow measurement of 0.1 to 6 m/s (0.3 to 20 ft/s) while maintaining the advantages of insertion sensor design. Ultraflon 500C bearings and Tungsten Carbide pin provide exceptional wear resistance.

The Signet 2540 offers field replaceable electronics and transient voltage suppression (TVS) to provide greater immunity to large voltage disturbances (i.e. lightning) sometimes encountered in field wiring. Sensors can be installed in DN40 to DN600 (1½ to 24 inch) pipes using the 1½ inch or ISO 7/1-R 1.5 threaded process connection.

The sensors are also offered in a hot-tap configuration with a bleed valve service without process shutdown in pipes up to DN900 (36 in.). Both styles of sensors must be used in full pipes and can be used in low pressure systems.

## Features

- Operating range 0.1 to 6 m/s (0.3 to 20 ft/s)
- Field replaceable electronics
- Non-magnetic RF detection
- Standard NPT or ISO process connections
- Hot-tap versions for installation/service without system shutdown
- For pipe sizes up to DN900 (36 in.)
- Adjustable sensor - one size for entire pipe range
- 7.6 m (25 ft) cable



## Applications

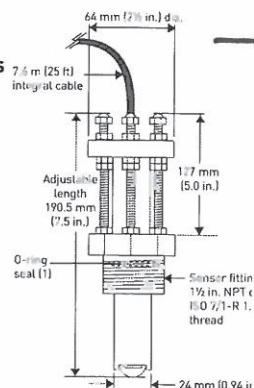
- HVAC
- Turf Irrigation
- Cooling Systems
- Filtration Systems
- Water Distribution
- Leak Detection
- Pump Protection
- Clarified Effluent Totalization
- Ground Water Remediation
- Gravity Feed Line

## Specifications

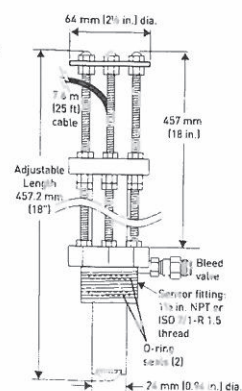
General			
Operating Range	0.1 to 6 m/s	0.3 to 20 ft/s	
Pipe Size Range	Standard Version	DN40 to DN600	1½ to 24 in.
	Hot-Tap Version	DN40 to DN900	1½ to 36 in.
Sensor Fitting Options	1½ in. NPT threads	ISO 7/1-R 1.5 threads	
Linearity	±1% of full range		
Repeatability	±0.5% of full range		
Min. Reynolds Number Required	4500		
Wetted Materials			
Body	316 stainless steel (1.4401)		
Fitting	316 stainless steel (1.4401)		
Fitting O-rings	FPM, optional EPR (EPDM)		
Rotor	17-4 SS Alloy		
Rotor Pin	Tungsten Carbide GRP 1 (standard) stainless steel (optional)		
Retainers (2)	316 stainless steel (1.4401)		
Rotor Bearings (2)	Carbon fiber reinforced PTFE		
Electrical			
Frequency	15 Hz per ft/s nominal		
Power	5 to 24 VDC ±10%, regulated, 1.5 mA max.		
Output Type	Open collector, sinking, max 10.0 mA		
Cable Length	7.6 m (25 ft), can be extended up to 300 m (1,000 ft)		
Cable Type	2-conductor twisted-pair with shield, 22 AWG		
Max. Temperature/Pressure Rating			
Sensor with standard FPM sensor fitting O-rings	17 bar @ 82 °C	250 psi @ 180 °F	
Sensor with optional EPR (EPDM) sensor fitting O-rings	17 bar @ 100 °C	250 psi @ 212 °F	
Operating Temperature	-18 °C to 100 °C	0 °F to 212 °F	
Shipping Weight			
	3-2540-1/-2/-1S/-2S	1.79 kg	3.9 lb
	3-2540-3/-4/-3S/-4S	2.15 kg	4.7 lb
Standards and Approvals			
	CE		
	RoHS compliant, China RoHS		
	Manufactured under ISO 9001 for Quality and ISO 14001 for Environmental Management		

## Dimensions

2540 High Performance  
Flow Sensor for 1½ to 24 in. pipes

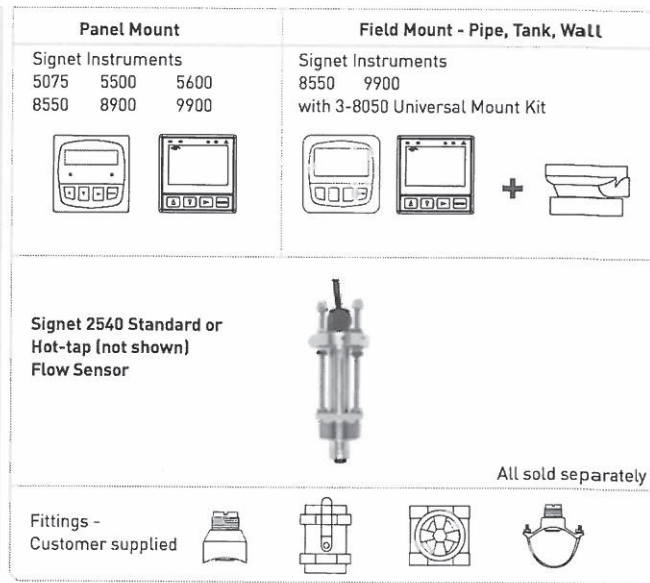


2540 Hot-Tap for  
1½ to 36 in. pipes



See Temperature and Pressure graphs for more information.

## System Overview



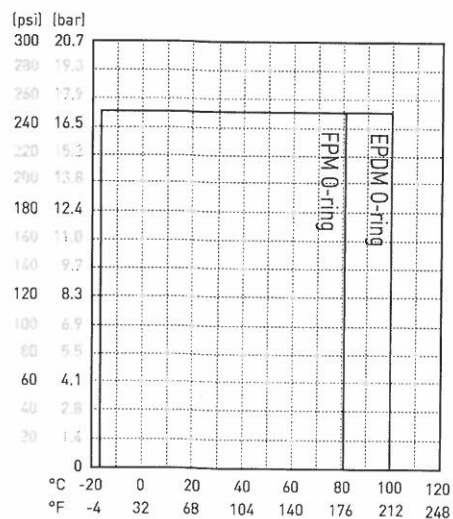
### Application Tips

- For systems with components of more than one material, the maximum temperature/pressure specification must always be referenced to the component with the lowest rating.
- Use the Conduit Adapter Kit to protect the cable-to-sensor connection when used in outdoor environments.
- Sensor electronics can be easily replaced by 3-2541.260-1 or 3-2541.260-2.

## Operating Temperature/Pressure Graphs

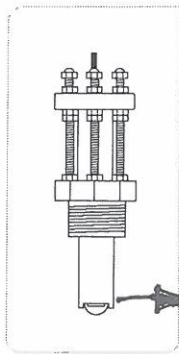
### Note:

The pressure/temperature graphs are specifically for the Signet sensor. During system design the specifications of all components must be considered. In the case of a metal piping system, a plastic sensor will reduce the system specification. When using a PVDF sensor in a PVC piping system, the fitting will reduce the system specification.



Please refer to Wiring, Installation, and Accessories sections for more information.

## Ordering Information



Mfr. Part No.	Code	Mounting Option	Rotor Pin Material
Stainless Steel High Performance flow sensor with removable electronics			
3-2540-1	<b>198 840 035</b>	1½ inch NPT thread	Tungsten Carbide
3-2540-2	<b>198 840 036</b>	1½ inch ISO thread	Tungsten Carbide
3-2540-3	<b>198 840 037</b>	1½ inch NPT thread, Hot-Tap design*	Tungsten Carbide
3-2540-4	<b>198 840 038</b>	1½ inch ISO thread, Hot-Tap design*	Tungsten Carbide
3-2540-1S	<b>159 001 501</b>	1½ inch NPT thread	316 Stainless Steel
3-2540-2S	<b>159 001 502</b>	1½ inch ISO thread	316 Stainless Steel
3-2540-3S	<b>159 001 503</b>	1½ inch NPT thread, Hot-Tap design*	316 Stainless Steel
3-2540-4S	<b>159 001 504</b>	1½ inch ISO thread, Hot-Tap design*	316 Stainless Steel

\*Must use 3-1500.663 Hot-Tap installation tool (ordered separately)

### Ordering Notes

Installation fittings and Hot-Tap valves are customer supplied.

## Accessories and Replacement Parts

Mfr. Part No.	Code	Description
3-1500.663	<b>198 820 008</b>	Hot-Tap Installation Tool (see Installation for more info)
1220-0021	<b>198 801 186</b>	O-ring, FPM (2 required per sensor)
1224-0021	<b>198 820 006</b>	O-ring, EPR (EPDM) (2 required per sensor)
1228-0021	<b>198 820 007</b>	O-ring, FFPM (2 required per sensor)
3-2540.320	<b>198 820 040</b>	Rotor kit, 2540 PEEK Bearing (old version)
3-2540.321	<b>159 000 623</b>	Rotor kit, 2540 Tungsten Carbide Pin (new version since January 1, 2000)
3-2540.322	<b>159 000 864</b>	Rotor kit, stainless steel pin and rotor
P52504-3	<b>159 000 866</b>	Rotor pin, Tungsten Carbide
P52504-4	<b>159 000 867</b>	Rotor pin, 316 SS
P52503	<b>198 820 013</b>	Bearing, carbon reinforced PTFE
P52527	<b>159 000 481</b>	Retainers, SS (1.4401)
3-2541.260-1	<b>159 000 849</b>	Standard replacement electronics module
3-2541.260-2	<b>159 000 850</b>	Hot-Tap replacement electronics module
5523-0222	<b>159 000 392</b>	Cable (per foot), 2 cond. w/shield, 22 AWG
P51589	<b>159 000 476</b>	Conduit adapter kit
P31934	<b>159 000 466</b>	Conduit cap

3-2540.099 Rev C (10/11)

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**ATTACHMENT B**

**PRESSURE GAGE INFORMATION**

## **XSEL™ Process Gauge - Stainless Steel Type 232.34 - Dry Case**

## **➤ Type 233.34 - Liquid-filled Case**

WIKA Datasheet 23X.34

### **Applications**

- For applications with high dynamic pressure pulsations or vibration a liquid filled case and socket restrictor are available
- Suitable for corrosive environments and gaseous or liquid media that will not obstruct the pressure system
- Process industry: chemical/petrochemical, power stations, mining, on and offshore, environmental technology, mechanical engineering and plant construction

### **Special features**

- Excellent load-cycle stability and shock resistance
- Solid front thermoplastic case
- Positive pressure ranges to 30,000 psi
- XSEL™ Process Gauge with 5 year warranty on gauge and 10 year warranty on pressure system (see terms and condition)
- All lower mount connection gauges are factory prepared for liquid filling

(LBM: must install membrane prior to field filling)

### **Standard Features**

#### **Design**

ASME B40.100

#### **Sizes**

4½" & 6" (115 & 160 mm) dial size

#### **Accuracy class**

± 0.5% of span (ASME B40.100 Grade 2A)

± 1.0% of span (ASME B40.100 Grade 1A)  
(for 20,000 psi range and above)

#### **Ranges**

Vacuum / Compound to 200 psi

Pressure from 15 psi to 30,000 psi

or other equivalent units of pressure or vacuum

#### **Working pressure**

Steady: full scale value

Fluctuating: 0.9 x full scale value

Short time: 1.5 x full scale value

#### **Operating temperature**

Ambient: -40°F to +150°F (-40°C to +66°C) - dry

-4°F to +150°F (-20°C to +66°C) - glycerine filled

-40°F to +150°F (-40°C to +66°C) - silicone filled

Medium: max. +212°F (+100°C) (See Note 1 on reverse)

#### **Temperature error**

Additional error when temperature changes from reference temperature of 68°F (20°C) ±0.4% for every 18°F (10°C) rising or falling. Percentage of span.



**Bourdon Tube Pressure Gauge Model 232.34**

#### **Weather protection**

Weather resistant (NEMA 3 / IP54) - without membrane

Weather tight (NEMA 4X / IP65) - dry case or filled case with membrane installed

#### **Pressure connection**

Material: 316L stainless steel

Lower mount (LM) or lower back mount (LBM)

1/4" or 1/2" NPT with M4 internal tap

#### **Restrictor**

Material: Stainless steel (0.6 mm)

#### **Bourdon tube**

Material: 316L stainless steel

≤ 1,000 PSI: C-type

≥ 1,500 PSI: helical type

#### **Movement**

Stainless steel. Internal stop pin at 1.3 x full scale

Overload and underload stops - standard

Dampened movement - optional

#### **Dial**

White aluminum with black lettering, stop pin at 6 o'clock

#### **Pointer**

Black aluminum, adjustable

#### **Case**

Black fiberglass-reinforced thermoplastic (POCAN)

Solid front, blowout back

Turret-style case with built in rear flange lugs

## Window

Clear acrylic with Buna-N gasket

## Case filling

Glycerine 99.7% - Type 233.34

Note 1: The maximum continuous media temperature for this gauge is 212°F. However, higher temperatures can be maintained safely for short term exposure per table to the right. The user should consider temperature error and gauge component degradation when exposing gauge to any media or ambient temperature above 212°F. For continuous use in either ambient or media temperatures above 212°F, a diaphragm seal or other heat dissipating means is recommended. Consult factory for technical inquiries and application assistance.

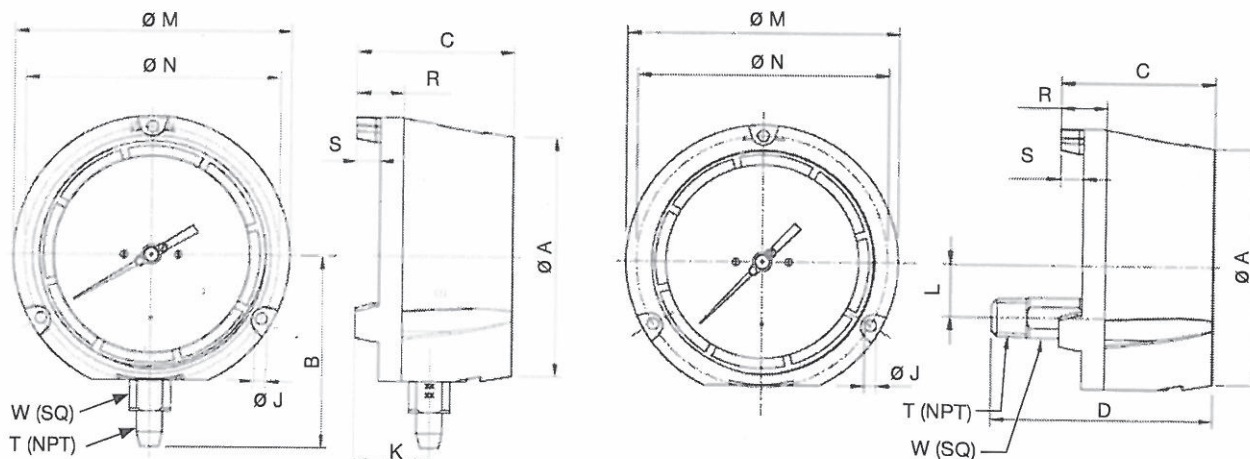
## Optional extras

- Silicone dampened movement
- Panel mounting adaptor kit (field assembled)
- Silicone case filling
- Halocarbon case filling
- Cleaned for oxygen service
- Instrument glass or safety glass window
- Drag pointer (maximum reading indicator)
- Alarm contacts switches (magnetic or inductive)
- Special process connections
- Custom dial layout
- External zero adjustment (4.5" size only)

Short term, intermittent maximum media temperature limits  
(Optional glass window required for all these temperatures)

500°F (260 °C) -	Dry Gauge
250°F (130°C) -	Liquid filled gauge
300°F (150°C) -	Dampened movement gauge

## Dimensions



Size		A	B	C	D	J	K	L	M	N	R	S	T	W	Weight <sup>1</sup>	
4.5"	mm	128	103	84	120.3	6.3	40	28.5	148	136.5	25	12.5		22	2 lb.	dry
	in	5	4.06	3.31	4.74	0.248	1.57	1.12	5.83	5.37	0.99	0.49	1/2"	0.87	3 lb.	filled
6"	mm	164	122.5	88	123.4	7.1	40.2	28.5	190	177.8	25.4	12.7		22	3 lb.	dry
	in	6.46	4.82	3.46	4.86	0.28	1.58	1.12	7.5	7	1	0.5	1/2"	0.87	4 lb.	filled

<sup>1</sup> Weight without optional accessories

### Ordering information

Pressure gauge model / Nominal size / Scale range / Size of connection / Optional extras required  
Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing.  
Modifications may take place and materials specified may be replaced by others without prior notice.



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